CLAIMS

What is claimed is:

1. A scanning optical monitoring system, comprising:

a tunable optical filter that scans a pass band across a signal band of a WDM signal to generate a filtered signal;

a photo detector that generates an electrical signal in response to the filtered signal;

a decision circuit that compares the electrical signal to a threshold; and

a controller that is responsive to the decision circuit to inventory channels in the WDM signal.

2. A scanning optical monitor system as claimed in claim 1, wherein the tunable optical filter tunes across the signal band in less than 1 millisecond.

3. A scanning optical monitor system as claimed in claim 1, wherein the tunable optical filter begins and ends a complete scan in less than 1 millisecond.

4. A scanning optical monitor system as claimed in claim 1, wherein the tunable optical filter tunes across one half of the signal band in less than 1 millisecond.

5. A scanning optical monitor system as claimed in claim 1, wherein the tunable optical filter is a Fabry-Perot filter.

6. A scanning optical monitor system as claimed in claim 1, further comprising an electronic filter that low pass filters the electronic signal from the photo detector prior to reception by the decision circuit.

7. A scanning optical monitor system as claimed in claim 1, wherein the controller compares an instantaneous pass band of the tunable filter to a response of the decision circuit to determine the channel inventory of the WDM signal.

8. A scanning optical monitor system as claimed in claim 7, wherein the controller compares the channel inventory to perpetual inventory information to assess a validity of the WDM signal.

9. A scanning optical monitor system as claimed in claim 1, wherein the tunable filter comprises an electrostatic drive cavity in which an electrostatic field is generated to displace a flexible membrane of the tunable filter.

10. A scanning optical monitor system as claimed in claim 1, wherein a free spectral range of the tunable filter is greater than a bandwidth of the signal band of the WDM signal.

11. A scanning optical monitor system as claimed in claim 1, wherein a free spectral range of the tunable filter is less than a bandwidth of the signal band.

12. A scanning optical monitor system as claimed in claim 1, wherein a free spectral range of the tunable filter is less than a bandwidth of the signal band but greater than one-half of the bandwidth of the signal band.

13. A scanning optical monitor system as claimed in claim 12, further comprising:

a WDM filter for separating the filtered signal into a first sub-band and a second sub-band; and

a first sub-band detector and a second sub-band detector.

14. A scanning optical monitor system as claimed in claim 1, further comprising a timing recovery circuit that controls sampling of the decision circuit by the controller.

15. A scanning optical monitor system as claimed in claim 1, wherein the controller generates a threshold set signal the specifies a level of the threshold applied by the decision circuit.

16. A scanning optical monitor system as claimed in claim 1, further comprising a filter tuning voltage generator that generates a tuning voltage to the optical tunable filter.

17. A scanning optical monitor system as claimed in claim 1, further comprising a filter tuning voltage generator that generates a tuning voltage to the optical tunable filter that improves a linearization of the tuning of the passband as a function of time over at least a portion of the scan of the signal band.

18. A scanning optical monitor system as claimed in claim 1, further comprising a filter tuning voltage generator that generates a tuning voltage to the optical tunable filter that linearizes the tuning of the passband as a function of time over at least a portion of the scan of the signal band.

19. A scanning optical monitor system as claimed in claim 1, wherein the filter tuning voltage generator maps an inverse of a tuning function of the optical tunable filter.

20. A scanning optical monitor system as claimed in claim 1, wherein the filter tuning voltage generator comprises a look-up table.

21. A scanning optical monitoring system, comprising:

a tunable optical filter that scans a pass band across a signal band of a WDM signal to generate a filtered signal;

a photo detector that generates an electrical signal in response to the filtered signal;

a variable decision circuit that compares the electrical signal to a variable threshold; and

a controller that sets a level of the variable threshold and is responsive to the decision circuit to analyze channel power in the WDM signal based on the level of the variable threshold.

22. A method for analyzing a WDM signal comprising:

tuning a pass band of a filter across a signal band of the WDM signal to generate a filtered signal;

detecting the filtered signal;

comparing a level of the detection signal to a threshold; and

comparing an instantaneous pass band of the filter to a level of the detection signal relative to the threshold to analyze channel inventory in the WDM signal.

23. A method as claimed in claim 22, further comprising tuning the filter across the signal band in less than 1 millisecond.

24. A method as claimed in claim 22, further comprising tuning the filter across one half of the signal band in less than 1 millisecond.

25. A method as claimed in claim 22, further comprising low pass filtering a detection signal prior to the step of comparing the detection signal to the threshold.

26. A method as claimed in claim 22, further comprising comparing the channel inventory to perpetual inventory information.

27. A method as claimed in claim 22, further comprising tuning multiple modes of the filter across the signal band simultaneously.

28. A method as claimed in claim 22, further comprising changing the threshold between scans to determined channel powers in the WDM signal.

29. A method as claimed in claim 22, further comprising driving the filter with a tuning function that is non-linear with response to time across the scan and improving a linearization of the tuning of the passband as a function of time over at least a portion of the scan of the signal band.

30. A method as claimed in claim 22, further comprising determining the instantaneous pass band of the filter by reference to a delay from a generation of a trigger signal starting the scan.

31. A method for analyzing a WDM signal comprising:

tuning a pass band of a filter across a signal band of the WDM signal to generate a filtered signal in a first scan of the WDM signal;

detecting the filtered signal;

comparing a level of a detection signal to a first threshold;

comparing an instantaneous pass band of the filter to a level of the detection signal relative to the first threshold;

tuning the passband of the filter across the signal band in a second scan of the WDM signal;

comparing the level of the detection signal to a second threshold;

comparing an instantaneous pass band of the filter to a level of the detection signal relative to the second threshold; and

comparing the first scan and the second scan to determined channel power.